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GUNN & LEE, P.C. 700 N. ST. MARY'S STREET SUITE 1500 SAN ANTONIO, TX 78205				
EXAMINER				
BELL, BRUCE F				
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1795				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

## Application No.

10/799,247

## Applicant(s)

DUNN ET AL.

## Examiner

Bruce F. Bell

## Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SE/US)  
Paper No(s)/Mail Date 3/12/04/11/05/04
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Okada et al (5334305).

Okada et al discloses an internal liquid for a reference electrode containing LiCl an ammonium nitrate in a dissolved state and at the same time in a gellated state wherein drying of the internal liquid in the gellated state is minimized so that the function of the internal liquid as a liquid bridge may be displayed for a prolonged period of time. See abstract. LiCl is disclosed to be a highly hygroscopic salt that is contained in the internal liquid of the electrode and is used in place of KCL so that the internal liquid may be prevented from being dried. See col. 1, lines 54-59. The internal liquid for the reference electrode contains an electrolyte showing a high hygroscopicity so as to keep the internal liquid from being dried up. See col. 1, lines 60-63. The reference electrode is made of a glass tube having a wire inserted into the solution in the tube which solution is gelled so that the wire and the internal solution are intimately contacted with each other. The lead wire and glass tube are bonded to each other with an epoxy resin to produce the reference electrode. The reference electrode with gel made in this

manner does not dry up and is not effected by changes in pH in the range of 3 to 12.

See Example.

The prior art of Okada et al anticipates the applicants instant invention as set forth in the instant claim. Since applicants instant claims are directed to the reference electrode, the examiner has not given any patentable weight to the voltmeter, working electrode or power supply. The aspect of the invention with respect to the fill solution not drying inherently is met as shown by the disclosure to Okada et al above and therefore the fill solution appears to have drawn moisture since this salt is set forth as being hygroscopic. Therefore, the prior art of Okada et al anticipates the applicants instant invention as shown above.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 12-17 rejected under 35 U.S.C. 102(b) as being anticipated by Bushman (6328877).

Bushman disclose a system for measuring the effectiveness of cathodic protection or corrosion resistance wherein a coagulate filled tube adapted for sensing electrical activity at a first end thereof is set forth and a second end of the coagulate filled tube is in communication with a reference electrode. A voltmeter is in communication with the electrode for supplying a reading of a voltage differential. A

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capillary tube is used in conjunction with a reference electrode and extends the reach of the reference electrode. A flexible conduit defines a continuous opening axially therethrough. The flexible conduit contains a conductive hydroscopic electrolyte coagulate such as gelatin or a crosslinked polymer. The conduit is adapted to communication at one end with an electrode that communicates with the coagulate. See abstract. The system for monitoring corrosion protection of an underground storage tank includes a coagulate or gel filled flexible plastic tube, a coagulate or a gel filled testing chamber and a soil surface mounted test box. The gel filled tube is inserted and sealed into the testing chamber and has a small container with a sealingly removable cap. A porous end cap of a ceramic plug may be placed at the tip or end of the tube to minimize ion exchange into and out of the tube. See col. 3, lines 40-56. A portable reference electrode having a porous tip is inserted into the gel filled chamber in order to make a reading. The sensing point for the reference electrode is at the end of the gel filled tube positioned under the storage tank. The sensing end maybe in contact with the ground, a metal or other surface or another electrode either under the ground or under water. See col. 3, line 60 – col. 4, line 2. A test lead wire is connected to the portable reference electrode from a DC terminal of a voltmeter. The voltmeter can be made to have a permanent or temporary connection to the structure being tested. If permanent, the lead is terminated in the test box and a temporary test lead is connected to this from the voltmeter terminal. The reference electrode can be removed and the voltmeter disconnected or it can be buried underground so that the gel filled capillary tube remains in place. The electrolyte gel or coagulate in the capillary does not require

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refilling and maintains its effectiveness without consequences to the surrounding environment. See col. 4, lines 3-21. The gel electrolyte is placed inside of a plastic tube having at one end a porous plug of a ceramic material wherein the porous plug allows the surrounding moisture and the salt to make contact with the gelled moisture in the tube. See col. 4, lines 47-51. A string or thread can be run up through the tube along with the gel to ensure that if an air gaps exist, the ions are able to jump across the air gap by capillary action through the moistened thread. A permanent reference electrode is located at the top of the tube to speed up the reading. See col. 4, lines 52-57. The gel or other coagulate must be hygroscopic so that it attracts and retains moisture and contain calcium chloride. See col. 5, lines 25-28.

Bushman anticipates the applicants instant invention as shown by way of the teaching to Bushman about with respect to the instant claims as set forth. Bushman sets forth a reference electrode in conjunction with a voltmeter and power supply, wherein the reference electrode has an electrode body that is in conjunction with a capillary tube containing a hygroscopic electrolyte and further having a porous ceramic plug at the tip of the tube, wherein the porous plug allows moisture of the surrounding area to make contact with the salt and the gelled moisture in the tube. The reference electrode is further disclosed to be capable of permanent or semi-permanent installation in the soil. Further the salt used is that of calcium chloride.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bushman (6328877) in combination with Tiwari et al (4601810) and Sheelor (3582531).

Bushman is as disclosed above in the 35 USC 102(b) rejection above.

Bushman does not disclose a cap having opening for passage of moisture from the environment or a wire that is relatively stable and a low rate of corrosion or that is an oxidized metal.

Tiwari et al discloses: an electrode housing having a cavity therein that has a magnesium rich molten salt and that the housing exposes the electrolyte to the melt via a porous ceramic frit wetted by the electrolyte. A hollow capsule contains the mg rich reference material and is immersed in the electrode and the reference material is electrically coupled to the melt through a second probe immersed therein. See abstract. The tubular housing is inert to the molten electrolyte which may be a eutectic mixture of  $MgCl_2$  and  $CaCl_2$ . The reference electrode shaft or wire is that of Molybdenum and extends from the capsule through the plug and out the top of the housing and is connected to the probe via wires and the voltmeter. See col. 3, lines 20—col. 4, line 1.

Sheelor disclose an electrical grounding device having a metal pipe capped and perforated at both ends and filled with deliquescent salts which dissolve to form an electrolyte. The pipe is buried vertically in the ground with only the perforated upper end protruding above the surface, to which electrical circuits are connected. Atmospheric air

enters and leaves the pipe through the exposed perforations and moisture is continually taken out of the air by the deliquescent material, dissolving some of the salts. The resultant solution leaks out through the perforations in the bottom of the pipe, penetrating and moistening the soil with electrolyte to provide a low resistance electrical path to ground. See abstract. The hygroscopic salts are those of sodium, calcium and magnesium chlorides, copper sulfates, and sodium hydroxide. See col. 2, lines 49-67. The choice of salt used to fill the pipe is governed by the type of soil in which the pipe is to be buried. See col. 2, line 68—col. 3, line 9.

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made because even though the prior art of Bushman does not disclose the cap having openings for the entry of moisture, the prior art of Sheelor shows that it is known to use openings in the top and bottom of the reference electrode to allow moisture to flow into the electrolyte salts to dissolve a portion of said salts. Even though the perforations are not in the cap, one having ordinary skill in the art would recognize that these openings can be found in the top portion of the tube or in the cap of the tube as long as the openings are available for entry of the air having moisture, so that the salt can be dissolved to maintain the electrolyte without drying. Further both Sheelor and Tiwari set forth that these salts are known for their hygroscopic and deliquescent properties in reference electrodes that are utilized. The Tiwari et al patent further sets forth that the reference electrode shaft is that of molybdenum and that due to the materials that are used, the molybdenum would be oxidizable. Therefore, the prior art of Bushman in combination with Tiwari et al and



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Sheelor renders the applicants instant invention as obvious for the reasons set forth above with respect to the instant claims as submitted.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bruce F. Bell whose telephone number is 571-272-1296. The examiner can normally be reached on Monday-Friday 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BFB  
April 17, 2008

/Bruce F. Bell/  
Primary Examiner, Art Unit 1795